REMARKS

Present Status of the Application

Claims 15 & 16 were withdrawn from consideration, and pending claims 1 and 3-7 still rejected under 35 U.S.C. 103(a) as being unpatentable over Sisson (US 4,107,364) in view of Collier (US 5,260,126).

In response, Applicants have further amended claim 1, canceled claims 15-16, added new claims 17-28 and submitted the remarks below. Reconsideration of claims 1 & 3-7 and consideration of new claims 17-28 are respectfully requested.

Discussion of Supports of New Claims 17, 18 & 19-28

New claim 17 is different from amended claim 1 in that **i)** the elastic nonwoven fabric is fabricated by a spunbonding method but not a melt-blowing method, **ii)** the spunbonding method uses an air sucker and collects the long elastomeric fiber and long nonelastomeric fiber spun by the spinneret on a collecting conveyor, and **iii)** the elastic nonwoven fabric has not been stretched after being manufactured. The features **i-ii** are supported by Examples 26-29, and the feature **iii** supported by paragraph **[0074]**. The sentence "*It is also possible to stretch the nonwoven fabric itself manufactured according to the invention*" in **[0074]** indicates that the stretching operation is optional. Moreover, Examples 26-27 describe non- stretched elastic nonwoven fabrics manufactured with a spunbonding method.

For new claim 18, elastic nonwoven fabrics manufactured with a spunbonding method and then stretched are described in Examples 28-29.

As for new claims 19-23/24-28 dependent from claim 17/18, they are analogous to current claims 3-7.

Discussions of Rejections under 35 U.S.C. 103(a)

As described in the "Description of The Prior Art" (col. 1, lines 42-64) of Sisson, the prior-art method that conveys filaments formed with a melt-blowing method to a collecting surface via a fluid stream cannot precisely control individual filaments. Therefore, Sisson mentioned in "Summary of The Invention" (col. 5, line 45-col. 6, line 27) that the filaments as spun are preferably directly drawn by a draw roller or belt to reduce the diameter thereof to one corresponding to the textile denier and then precisely guided with a belt or an air aspirator to the collecting positions as the destinations on the collecting surface.

Moreover, as described in col. 6, line 66-col. 7, line 8 of Sisson, in the prior art using a melt-blowing method to spin filaments, the filament stream cannot be smoothly guided due to the turbulences in the air flow so that respective positions of individual filaments cannot be precisely controlled.

Accordingly, Sisson teaches away to use a melt-blowing method in manufacturing an elastic nonwoven fabric.

Since Collier uses a melt-blowing method but Sisson particularly teaches away to use a melt-blowing method, it is non-obvious to combine Collier and Sisson. Even if they are combined purposely, their combinative process would still not use a melt-blowing method. On the contrary, the nonwoven fabric of claim 1 is obtained with a melt-blowing method.

Moreover, according to the description concerning the prior art using a fluid stream to convey filaments in the "Description of The Prior Art" of Sisson or the description about the air flow used in the prior art, the prior art of Sisson may alternatively be a conventional spunbonding method using an air sucker, another method using an air sucker or a method utilizing a similar mechanism. That is, Sisson teaches away a conventional spunbonding method using an air sucker.

Accordingly, when Collier *that uses a spunbonding method but not mentions use of an air sucker* is combined with Sisson, the elastic nonwoven fabric obtained therefrom is one made with a spunbonding method which does not use an air sucker but features that the filaments as spun are directly drawn by a draw roller or belt to reduce the diameter thereof to one corresponding to the textile denier and then precisely guided by a belt or an air aspirator to the collecting positions as the destinations on the collecting surface.

For at least the above reasons, amended claim 1 where the manufacturing method of the elastic nonwoven fabric is limited to a melt-blowing method as well as new claim 17 where the manufacturing method is limited to a spunbonding method using an air sucker are non-obvious over the combination of Sisson and Collier.

Moreover, Applicants respectfully submit that the following points further enhance the non-obviousness of independent claims 1 & 17 and the dependent claims.

1. In Example 1 of Sisson, PET (non-elastomeric) filaments as spun are drawn by a draw roller in a speed of 1460 surface feet per minute to have a titre of 3.6 denier (=19.2μm, as calculated in the Response filed on 11/22/2006), polyurethane (elastomeric) filaments as spun are drawn by a draw roller in a speed of 384 surface feet per minute to have a titre of 5.4 denier (=25.3μm), and the respective filament layers are laminated to obtain a three-layer laminate. Examiner asserted that the feature "Bd/Ad≥2" of the invention is obvious for the diameter of the elastomeric fiber is larger than that of the nonelastomeric fiber.

However, the fiber diameters before the drawing of the draw rollers in Example 1 of Sisson cannot be accurately acquired from the description thereof. By simply considering the rotation speeds of the draw rollers, the ratio "Bd/Ad" before the drawing should be smaller than that (1.32) after the drawing, because the rotation speed of the draw roller for the PET (nonelastomeric) fibers is 3.8 (1460/384) times the speed of the draw roller for the polyurethane (elastomeric) so that Ad is reduced more than Bd by the drawing.

On the other hand, ***by adjusting the extrusion rates*** of the elastomeric resin and the nonelastomeric resin, this invention can simultaneously form an elastomeric fiber and a nonelastomeric one with ***different diameters*** from spinning holes with ***the same diameter*** on one spinneret, as indicated by **[0061]** of the specification. Some Examples of this invention use a fiber-mixing nozzle having spinning holes of the same diameter (0.3mm) to extrude the elastomeric resin and the nonelastomeric resin in a rate (g/minute) ratio of 0.242/0.013 (Example 1), 0.230/0.026 (Example 2) or 0.204/0.051 (Example 3), wherein the extrusion rate of the

elastomeric resin is much higher than that of the nonelastomeric resin so that the diameter of the elastomeric fiber is larger than that of the nonelastomeric fiber. As for Example 1 of Sisson, it repeatedly uses a spinning device with spinning holes of 0.02 inch to extrude polyurethane (elastomeric resin) and PET (nonelastomeric resin) in a rate (g/minute) ratio of 0.07/0.18, wherein the extrusion rate of the elastomeric resin is much lower than that of the nonelastomeric resin, as being contrary to the case of Examples 1-3 of this invention.

Hence, it is reasonable to say that the elastomeric filament as discharged from the spinning holes is thinner than the nonelastomeric filament as discharged from the same so that "Bd/Ad<1" is satisfied before the drawing. Accordingly, Sisson fails to suggest the configuration or concept that *the diameter of the elastomeric fiber is larger than that of the nonelastomeric fiber (Bd/Ad>1)* ***before the drawing***. Since Collier even does not disclose Bd/Ad>1 before the drawing, it is non-obvious in view of the combination of Sisson and Collier to set *the ratio "Bd/Ad" of a non-stretched (non-drawn) nonwoven fabric* larger than 2 as in claim 17.

The nonwoven fabric of this invention satisfying the limitations of new claim 17 can be used, without being stretched or after being stretched, in various applications. In a nonwoven fabric of this invention, an elastomeric fiber and a nonelastomeric one with specific diameters and diameter ratio are uniformly mixed so that the probability of two elastomeric filaments contacting each other is reduced, thus reducing the occurrence of blocking that is caused by the contact and is an indicator of the separation resistance of two sheets of the nonwoven fabric.

Accordingly, to reduce the occurrence of blocking in this invention, the limitation "Bd/Ad>2" in independent claim 17 is essential to be satisfied at the stage of collecting the

elastomeric fiber and the nonelastomeric fiber on the collecting conveyer by the air sucker, wherein the stage is before the stretching process. However, Sisson does not care the fiber diameter ratio before the drawing, which is even smaller than one reasonably. Hence, the feature of claim 17 *that the fibers of the nonwoven fabric are not stretched/drawn and satisfy the limitation "Bd/Ad≥2"* is non-obvious over the combination of Sisson and Collier.

2. In Example 1 of Sisson, a web including polyester fibers of 3.6 denier is firstly formed, and then polyurethane elastomeric fibers of 5.4 denier weighting $12g/m^2$ is laminated on the top of the polyester web formed previously, and then the same polyester fibers weighting $12g/m^2$ is laminated over the two layers to form a three-layer unbonded web (col. 17, line 30). The web obtained by laminating tree layers is thermally bonded with a heated metal-coated bonding roll nip (col. 17, lines 30-32) to form a bonded fabric.

Accordingly, it is clear that the web made in Example 1 of Sisson is a three-layer unbonded web. Moreover, it can be known from the above manufacturing method that the two kinds of fibers constituting the three layers are arranged mostly separated from each other but are not uniformly mixed to form one layer as in claims 1 and 17.

For the feature of claim 1 that the elastomeric and nonelastomeric fibers are mixed uniformly, Examiner argue that col. 6, lines 54-56 of Sisson states "*It is further noted that the reference teaches mixing and intermingling of the filaments prior to collection there of on the forming surface*" so that the feature has been disclosed. However, the above words are merely

a part of the sentence in col. 6, lines 49-56, and the accurate meaning thereof should be interpreted by referring to the whole sentence.

Specifically, according to the whole sentence "*forwarding may be accomplished* ***by*** ***separate forwarding means for each stream, if plural streams are formed,*** *such as air aspirators or belt means to provide a layered web on the forming surface* ***or by a single forwarding means,*** *such as an air aspirator or a single belt means* ***to mix and intermingle the filament prior to collection thereof on the forming surface***", the words quoted by Examiner **actually** relates to mixing of filaments in **one** filament stream with a single forwarding means as an air aspirator or a belt. In fact, the whole specification of Sisson describes only layered weds formed by laminating filament layers respectively formed from an elastomeric resin and a nonelastomeric resin. Hence, Sisson clearly discloses that the number of separate forwarding means used to laminate multiple filament streams are the same as the number of the filament streams, but does not disclose that the fibers in different filament streams are mixed.

As a result, the web of Example 1 of Sisson that is assumed to be manufactured by repeatedly using a single forwarding means three times or by using three forwarding means is a three-layer unbonded web. That is, Sisson fails to disclose or suggest mixing different kinds of fibers uniformly.

3. The common feature of the apparatuses respectively illustrated in FIGs. 1, 5 & 7 is the melt-blowing die 16 (col. 10, line 48). That is, the manufacturing apparatus/method specifically disclosed in Collier is a melt-blowing apparatus/method.

Examiner asserted that teaching of using micro fibers (of diameters of about 100 microns or less, for example, 0.5-50microns) in col. 2, lines 28-33 of Collier reads on the values claimed. However, col. 2, lines 28-33 of Collier is just for defining the term "microfibers". Though col. 2, lines 34-40 of Collier describes that the melt-blown fibers have the diameters of microfibers, the specification of Collier never mentions what diameter *the spunbonded fibers manufactured by Collier* have.

In fact, according to col. 5, lines 1-3 of Collier: "*The elastic nonwoven web of fibers may be a web of meltblown fibers or spunbonded fibers. The meltblown fibers may be microfibers.*" and col. 13, lines 51-54 of Collier: "*The nonelastic fiber 64 may be microfibers or the nonelastic fiber 64 may be macrofibers having an average diameter of from about 300 microns to about 1000 microns*", it is proper to say that the diameter of the spunbonded fibers used in Collier is 300-1000μm.

Collier fails to disclose or suggest setting "Bd/Ad≥2" when the elastomeric fiber and the nonelastomeric fiber are both spunbonded fibers and Bd is 5-40μm. Though the diameter ratio range is 300/1000 to 1000/300 in Collier that overlaps with the range of "Bd/Ad≥2", Bd is up to 300-1000μm in Collier.

The nonwoven fabric of new claim 17 includes a long elastomeric fiber and a long nonelastomeric fiber spun with a spunbonding method that uses a spinneret having both a spinning hole for discharging elastomeric resin and another spinning hole for discharging nonelastomeric resin thereon, wherein Bd is 5-40 μm and the ratio "Bd/Ad" no less than 2.

Collier fails to disclose a spunbonded elastomeric fiber with a diameter of 5-40μm.

Accordingly, new claim 17 cannot be obtained by combining Sisson and Collier.

4. Examiner mentions in Pages 4-5 that the reference (Sisson) teaches, in col. 6, lines 42-47, that at least two separate streams of monofilaments of ***one or more*** fiber forming synthetic organic polymers are melt spun through ***one or more*** preferably linear dies or spinnerets from ***one or more*** extruders. The description in col. 6, lines 42-47 does not include a case where one spinneret is used to simultaneously spin two kinds of fibers from two fiber forming synthetic organic polymers, which is understood by referring to Figs. 6, 13 & 19 of Sisson that illustrate some apparatuses embodying the description in col. 6, lines 42-47 of Sisson.

As stated in col. 19, lines 51-68, in the apparatus of Fig. 6, two separate streams 40 and 42 of monofilaments of two fiber forming synthetic organic polymers are melt spun through two die heads or linear spinnerets 36 and 38 from two extruders 32 and 34. The streams 40 and 42 are both monofilament streams. Accordingly, the streams 40 and 42 include different polymers, i.e., two kinds of polymers.

In the apparatus of Fig. 13, one stream 40 of filaments of one (or more) fiber forming synthetic organic polymers are melt spun through one die head or linear spinneret 36 from one extruder. In Fig. 13, though the one extruder is not shown, one connecting, filtering and homogenizing means (col. 19, line 56) as shown in Fig. 6 is shown to extend from the die head or linear spinneret. Therefore, the extruder is surely present. Since only one connecting, filtering and homogenizing means is used, the die head or linear spinneret cannot

simultaneously spin two kinds of fibers from two fiber forming synthetic organic polymers. Hence, when there are two fiber forming synthetic organic polymers, they are blended in the one connecting, filtering and homogenizing means so that only one kind of fiber is obtained including the two fiber forming synthetic organic polymers.

As described in col. 36, lines 41-50, in the apparatus in Fig. 19, three separate streams 40 (non-elastic filaments), 42 (elastomeric), 40 (non-elastic) of monofilaments of two fiber forming synthetic organic polymers (non-elastic polymer and elastomeric polymer) are melt spun through three die head or linear spinneret from three extruder 32, 34, 32.

Since one die head or linear spinneret corresponds to one connecting, filtering and homogenizing means in the apparatus in any one of Figs. 6, 13 & 19 of Sisson, it is impossible for Sisson to simultaneously spin different kinds of fibers (elastomeric and nonelastomeric) with one spinneret and obtain one filament stream including different kinds of fibers. That is, Sisson fails to teach to use a spinneret having both a spinning hole for discharging elastomeric resin and another spinning hole for discharging nonelastomeric resin thereon in manufacturing an elastic nonwoven fabric.

Since Collier does not discuss the above issue, the combination of Sisson and Collier also fails to teach to use a spinneret having both a spinning hole for discharging elastomeric resin and another spinning hole for discharging nonelastomeric resin thereon in manufacturing an elastic nonwoven fabric, so that the mixing uniformity of the elastomeric fiber and the nonelastomeric fiber in *an elastic nonwoven fabric made with the method of Sisson+Collier* is lower that in *an elastic nonwoven fabric of claim 1 or 17*.

In summary, Collier uses a melt-blowing method in manufacturing a nonwoven fabric but Sisson teaches away to use a method with fluid conveying of filaments like a melt-blowing method or a spunbonding method using an air sucker, so that it is non-obvious to combine Collier with Sisson. Even if Collier and Sisson are combined purposely, the long elastomeric fiber and the long nonelastomeric fiber in the nonwoven fabric of claim 1/17 are mixed more uniformly than those in the product of Sisson+Collier, because they are spun by a spinneret having both a spinning hole for discharging elastomeric resin and another spinning hole for discharging nonelastomeric resin thereon and Sisson does not teach to mix different kinds of fibers. Moreover, Sisson not only fails to disclose "Bd/Ad≥2" after the drawing by draw rollers but also implies "Bd/Ad<1" before the drawing, and Collier fails to **disclose** "Bd/Ad≥2" when a spunbonded elastomeric fiber with a diameter of 5-40μm is used and fails to **suggest** "Bd/Ad≥2" in all cases as not knowing the importance of the ratio.

More importantly, with the uniform mixing of the long elastomeric fiber and the long nonelastomeric fiber and the feature of "Bd/Ad≥2", the probability of two elastomeric fibers contacting each other is much reduced in the nonwoven fabric of claim 1/17 as compared with the prior art, so that the occurrence of blocking of elastomeric fiber is reduced to make two sheets of nonwoven fabrics have a lower separation resistance, even when the amount of the long elastomeric fiber is much larger than that of the long nonelastomeric fiber, e.g., when the weight ratio of the long elastomeric fiber to the long nonelastomeric fiber is as large as 95/5. This should be quite reasonable without the support of a demonstration based on comparative experiments.

For at least the above reasons, Applicants respectfully submit that independent claims 1 & 17 and claims 3-7 & 18-28 dependent therefrom all patently define over the prior art.

CONCLUSION

For at least the foregoing reasons, it is believed that claims 1, 3-7, and 17-28 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
J.C. PATENTS

Jiawei Huang
Registration No. 43,330

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4 Venture, Suite 250
Irvine, CA 92618
Tel.: (949) 660-0761
Fax: (949)-660-0809